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AUTUMN IN NEW ENGLAND, Manchester, Vermont. *(Photo by Winston Pote from A. Devaney, N. Y.)*

New Manufacturers' Experiences in New England[1]

In 1949 the *Monthly Review* reported on the location activities of 106 manufacturers who set up new establishments in New England in the three years following World War II. This article reports the findings of follow-up interviews with these firms during 1954 and 1955. Major objectives of the interviews were to determine how many of the 106 manufacturers were still in business, which ones had grown or declined, the principal problems that had arisen, and whether the firms would now select the same location they had chosen earlier.

MOST NEW ENGLAND communities are trying to get new manufacturing operations established in their area to help them grow and prosper. While encouraging expansion of existing firms, many communities seek to reduce dependence on a single manufacturer or a single industry by hunting for entirely new establishments. What are the most productive hunting grounds? Should they concentrate on obtaining new branch plants of existing manufacturers? Should they try to convince manufacturers in other areas to relocate in their town? Or should they bend their efforts to supporting the establishment and growth of entirely new firms?

Some of these questions are answered by reinterviews during 1954 and 1955 with firms established in the immediate postwar period.[2] Eighty-nine of 106 concerns which established new operations in New England in the 1945-48 period were still in business in the region at the beginning of 1955. Two additional firms were also still in business, but had moved to New York City.

The original study included 42 entirely new manufacturing firms, 20 concerns which relocated in New England from other locations within or outside of New England, and 44 branch plants of existing concerns, some with headquarters within the region and others with main plants outside of New England.

According to the second survey, branch plants enjoyed the highest rate of success, followed by new firms and relocations in that order. Only three branch plants, or seven per cent of the number established in the region, had ceased operations by 1954-55. They had employed only 50 workers in 1948.

Nine new firms employing 333 persons in 1948 had failed by 1954. This was a failure rate of 21 per cent of the new firms studied. Five of the nine new firms which failed were in the textile and apparel industries. In these industries there were special opportunities for new firms to meet pent-up postwar demands during the time period covered by the original survey. But the failure rate in these industries was higher than in most industries.

The record of the 20 relocated firms was the least successful, in spite of their larger average size compared with the new firms. At least 335 jobs were lost by the failure of five relocated firms. Their failure rate of 25 per cent was the highest of the three categories.

It would be improper to conclude from this evidence about failures that geographic aspects of the locations selected were solely responsible for the variations in experience. One would naturally expect branch plants of established firms to exhibit a lower rate of failure than entirely new firms. The branches are parts of fully established enterprises with financial resources and staffs of men trained and experienced in production, finance, sales, personnel relations, and the other phases of the particular business. These concerns with several years of experience could often anticipate and avoid or overcome some of the difficulties of a new firm. New firms, however, have to build up such experience over time. In many new firms, the president had to perform several functions, such as production and sales manager, financier, purchasing agent, and accountant.

It is entirely proper to point out, however, that in general, most new firms based their location decisions

[1]This report is based on a survey conducted by Miss Carmela Santoro, head of the Social Studies Department, Warwick, Rhode Island High School, under a fellowship of the Fund for the Advancement of Education, established by the Ford Foundation.

[2]See "Why New Manufacturing Establishments Located in New England: August 1945 to June 1948," by George H. Ellis, *Monthly Review*, Federal Reserve Bank of Boston, April 1949.

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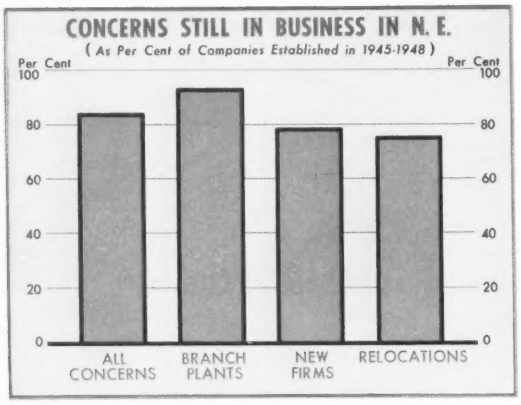


largely on personal considerations arising out of their background. Many of these concerns did not give careful consideration to the selection of the best location for their operations. Most of the branch plants, on the other hand, selected their sites only after painstaking analysis of several location factors. Because of this, branch plants would be expected to encounter fewer unforeseen difficulties.

The concerns which relocated selected their sites by following a course between the pattern of the branch plants and that of the new firms. They might be expected to have a lower failure rate than entirely new firms because of this and because they had accumulated valuable experience and working relationships. The slightly higher failure rate among relocations than among new firms probably indicates that the relocating firms had problems not necessarily stemming from their geographic locations. They probably brought some of these problems with them when they shifted locations.

There also appeared to be a tendency among relocating concerns to be somewhat footloose. A majority of the firms which relocated chose the particular community in the area they had selected primarily because of the existence of suitable space in that community. Perhaps they would have fared better if they had given more detailed attention to other location factors.

Seventeen of the 106 concerns studied had ceased operations in New England by 1955. What happened to them? Fifteen went out of business and two moved to New York City. Of the two removals, one had relocated in Connecticut from New York City in 1946. It returned to the city after three years because the distance from its market proved to be a great disadvantage and because it merged with another New York company which preferred a centralized organization. The other concern that moved was a new firm organized in Rhode Island. It reorganized when it moved to New York and changed its name and management. This firm could not be located for an interview — it had moved again without leaving a forwarding address.

Among the fifteen concerns that ceased operations, three were small branch plants that had been established to do special work or to take care of a temporary overflow. When the experiments were completed and the overflow no longer existed, the branches were closed.

It was difficult to obtain information regarding the reasons for failure among the new firms and relocations because persons associated with these firms could not always be found. No information could be obtained on five companies. Among the seven other concerns, the main reasons for failure were inexperienced management, inability to get new orders, unstable labor force, and inability to meet prevailing wage rates in the area.

Firms That Grew

Important changes have occurred since 1948 in most of the firms originally studied. As previously noted, 16 per cent of them are no longer in business in New England. Some of the others have grown, some have declined, and a few have remained about the same. Total employment in all the firms studied has increased from 13,595 to 23,757.

Nearly 60 per cent of the 89 concerns which are still in business in New England have made progress in several fields, including employment. Fifty-three companies now employ more workers than they did in 1948, 16 employ about the same number, and 18 have suffered a decline in employment.

Branch plants have enjoyed the greatest rate of success, as shown in an accompanying chart. Sixty-eight per cent of the branch plants, 43 per cent of the new firms, but only 25 per cent of the relocations now employ more workers than they did in 1948.

Branch plants also show the best record in employment changes, more than doubling their workforces between 1948 and 1954-55. Furthermore, only two firms in this group believe they have reached peak employment at these branches. The new firms now employ about 50 per cent more workers than they did in 1948, but the relocations have 8 per cent fewer employees.

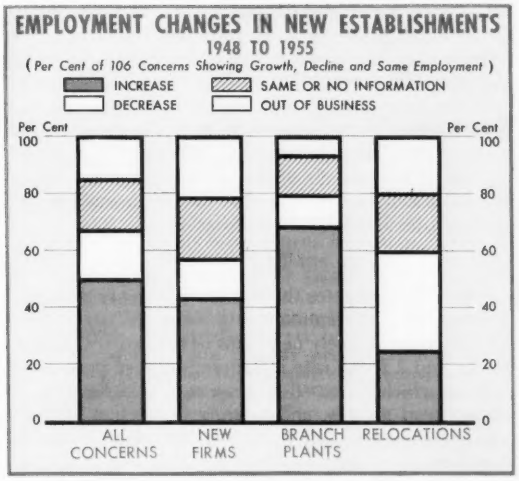
Firms That Didn't Grow

Sixteen of the firms established in the 1945-48 period employed practically the same number of workers in 1954-55. While employment did not expand in these concerns, most of them added to or made improvements in their plant, equipment, and products and increased their gross sales.

Half of the concerns in this group are new firms, five are branch plants, and three are relocations. Part of the reason for lack of growth in many of the new firms lies in the philosophy of their presidents. Most of them are content with things about as they are — they are more concerned with earning a living and continuing their present pattern of life than with expanding. The branch

EMPLOYMENT CHANGES, 1948 - 1955

Type of Concern	106 Firms 1948	89 Firms 1955	Per Cent Change	89 Firms Still in Business 1948	89 Firms Still in Business 1955	89 Firms Still in Business Per Cent Change
New Firms	2,136	3,167	+ 48.3	1,803	3,167	+ 75.7
Branches	7,984	17,400	+117.9	7,934	17,400	+119.3
Relocations	3,475	3,190	− 8.2	3,140	3,190	+ 1.6
Total	**13,595**	**23,757**	**+ 74.7**	**12,977**	**23,757**	**+ 84.5**



plants and relocated firms, however, hope to grow larger in the future.

Eighteen firms now employ fewer workers than in 1945-48. Fourteen per cent of the new firms, 11 per cent of the branch plants, and 35 per cent of the relocations suffered a decline in employment. They are classified as companies which declined even though some made progress in other directions.

One of the main differences between the declining firms and the failing concerns is that the declining companies have analyzed the reasons for some of their problems and are trying to correct them. Some seem to be working out of their difficulties. None of these concerns is considering going out of business. Their managements exhibit considerable vigor and determination to succeed.

Poor management was the major reason for decline in all six new firms that contracted. Four of them are now under new ownership, while a fifth has reorganized. Only one of the five branch plants that contracted appeared to be in difficulty.

Three of the relocations which suffered a decline in employment are located in Massachusetts, three in Connecticut, and one in Rhode Island. Availability of suitable space and labor were the main reasons for all of these concerns shifting their locations. After they relocated, however, other problems arose — poor management, lack of attention to details, labor difficulties, lack of sales ability, higher distribution costs, and defective products.

The major reasons for failure of the 17 concerns no longer operating in New England have already been indicated as well as the reasons for lack of growth among those experiencing steady or declining employment. Of equal importance are the reasons for success among the firms which prospered and grew and the problems encountered by these concerns which selected New England locations.

The problems which arose most frequently revolved around faulty management, poor attitude and quality of labor, inadequate supervisory personnel, defective products, poor sales policy, high transportation costs, inadequate facilities, high taxes, a shortage of capital, competition, and negative community attitudes.

The problems encountered were many and varied, but not insurmountable. Some of the problems arose from faulty selection of sites, but most of them were not related to the particular location of the firm. Large concerns generally either had fewer problems than smaller firms or could solve them more easily because of greater personnel and financial resources.

Reasons for Success

To try to determine why some concerns succeed while others fail, the companies which grew and expanded were asked, "To what do you attribute your success?" The reasons which were listed most frequently involved management ability, the quality of their products, and the attitude and quality of their workers. These were the same factors which were cited as the reasons for a decline or even failure of some companies.

Leadership ability and vigorous personalities of top management, thorough planning, knowledge of manufacturing skills, good marketing ability, a good product, and a well-trained conscientious workforce generally made for success.

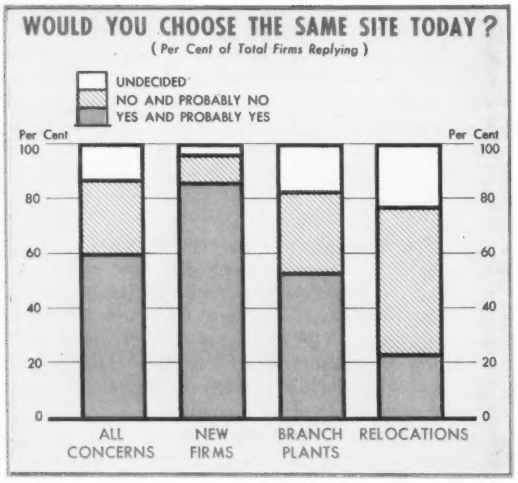
A comparison of the factors dominating the location decisions of firms which grew with those of concerns which failed or declined shows some interesting differences. During the 1948 interviews, the 53 concerns which subsequently grew mentioned an average of 3.3 factors which played an important part in their location decisions. The 35 companies which ceased operations in New England or had a decrease in employment reported an average of 2.3 factors. This indicates that successful firms were more alert to the important location factors.

When the availability of materials, production relationships, and relationships through management connections played a dominant part in a firm's choice of location, the concern generally succeeded. Most of the firms reporting these factors as important, however, were branch plants. Among the concerns which based their location decisions on labor considerations, more than three succeeded for every one that failed. The availability of a suitable supply of labor was also mentioned most frequently by branch plants. Entirely new firms which based their location on market considerations were successful in four cases out of five. Marketing advantages of the location also generally resulted in success for branch plants, but not for relocations.

Locations in which personal considerations assumed an important role resulted in failure or declining employment more often than success. Relocations which

SURVEY PROCEDURE

The procedure followed in this study was similar to that used in the original survey. Each of the 106 firms which could be located was approached personally and a confidential interview was held with the official most responsible for selection of the New England location. Reliable information was obtained on 101 of the 106 firms originally studied. Only two firms which were still in business refused to grant interviews. Three of the original firms could not be located nor could any information about these concerns be obtained from other sources.



allowed personal reasons to influence their choice of location were particularly likely to decline or fail. Locations of new firms and relocations where the availability of a suitable plant played a dominant role also tended not to succeed.

Most Firms Would Still Select the Same Location

Even though some firms encountered special problems related to their particular location, most of the firms were satisfied with their location decisions, as shown in an accompanying chart. Forty-five out of 75 concerns which answered the question, "If you had to make the same decision to locate now, would you choose the same site?" replied that they would. Most of the twenty firms which said they would not make the same choice today referred to the particular community in which they were located. They would still prefer a New England location.

Only five companies indicated that they would now choose a site outside of New England. In two of these cases mergers of the original firms were the major reasons for recasting their locational decisions. A desire to be closer to their sources of raw materials and high transportation costs would lead two other concerns to seek more central locations.

The chart shows that 86 per cent of the remaining new firms are satisfied with their present sites, compared to 53 per cent of the branch plants and only 23 per cent of the relocations. The individuals who established new firms were generally of New England origin and this conditioned their locational decisions. In spite of the problems which have arisen and the difficulties which still remain unsolved for some of these firms, all except three have been satisfied with their site and would choose the same one today.

Ten branch plants and seven relocations indicated that they would probably select a different community now than they had in 1945-48. Transportation costs and other factors related to transportation facilities, taxes, and traffic congestion were the major factors which would lead branch plants to reconsider their location decisions. Two branches needed cheaper electric power. Although several firms deplored the "poor attitude" of labor, only one singled out union activity as the major factor in reconsidering its location decision.

Difficulties in expanding at the present site influenced two relocations. Many of the relocations which said that they were not satisfied with their present locations had been unable to solve some of their problems, several of which centered around labor considerations. In appraising the reasons for dissatisfaction given by the relocations it is well to remember that these concerns had not been satisfied at their former locations.

Conclusions

This study indicates that branch plants are generally a better bet for communities looking for new manufacturers than entirely new firms or relocations. Branch plants had a lower rate of failure, a larger proportion of firms which increased employment, a higher rate of employment growth, and a larger proportion of firms which expected to add workers in the future than the new firms or relocations. Branch plants also tended to have fewer problems than the other types of concerns. In addition, they generally had larger financial and personnel resources than new firms and relocations, which enabled them to more easily solve problems which arose.

A community's chances for creating permanent new jobs by attracting entirely new firms also appear to be good, particularly if the new firms are given every assistance possible. A larger proportion of new firms than of branches or relocations were satisfied with their present locations. For smaller communities which don't have a large labor supply, or which are seeking only small or medium-sized employers, new firms seem especially desirable.

In searching for new business, communities should carefully examine the quality of management, for this was the factor that was most important in determining success or failure. Even if the new management is of excellent quality, the community should appreciate the magnitude of special problems facing a new firm and endeavor to smooth its path to success.

Relocations appear to be a poor type of concern for communities to try to attract. Firms which moved their operations from one area to another failed more often and had a larger proportion of concerns with declining employment and a smaller proportion with greater employment than the new firms or branches. Several of the relocations included in this study seemed to bring many problems with them. Many did not appear to consider carefully all aspects of their new location before moving.

Communities trying to increase and diversify their factory employment should concentrate their efforts on industries which are growing and for which they can offer concrete advantages. Communities would also be well advised to make available more realistic information which presents the shortcomings as well as the advantages of their area so that firms considering the community will be able to appraise all factors as they relate to their operations. This will lessen the chances of running into unforeseen difficulties. This study showed that firms which made their location decisions on rational grounds, after carefully analyzing all location factors which had an important influence on their operations, enjoyed the greatest success.

Monthly Review
FEDERAL RESERVE BANK OF BOSTON

Atomic Energy and New England

Part II — Power, Production, Progress

Atomic energy is becoming increasingly important to the New England economy. It is now supplying a variety of useful tools for New England's industries and it is expected that, eventually, it will produce a large fraction of the region's electric power. In addition, New England firms are already producing a great variety of nuclear instruments and equipment and are expected to expand their operations as new uses for the application of atomic energy are discovered.

DURING the last twenty years, scientists have harnessed atomic fission and, thereby, have uncovered an almost inexhaustible supply of energy.

They have also devised several different methods of producing, controlling, and measuring nuclear radiation. In so doing, they have created a whole array of new research and production tools for science, industry, medicine, and agriculture. These nuclear tools are creating new products. They are also revolutionizing certain industries and forcing changes in the operations of many others.

Last year the New England Governors' Conference appointed a distinguished committee of scientists and businessmen to recommend ways in which this region could best participate in the expanding nuclear technology. The August *Monthly Review* reported on some of the Committee's findings, paying particular attention to the importance of the operating experience obtained by New England's schools, industries, and independent laboratories in developing nuclear technology during and after World War II.

This article discusses the Committee's findings concerning the civilian applications of atomic science as well as the opportunities for New England enterprise in the nuclear age.

These civilian uses of nuclear technology can be divided into five categories.

I. *Power*

It is now technically feasible to generate electricity from fissionable uranium and plutonium. In the judgment of most experts, however, it will be several years before nuclear energy can compete economically with conventional sources of power in this country. The large capital costs and the cost of reprocessing fuels make it relatively expensive. Nuclear power can make an immediate contribution to the economies of only those regions which have very high fuel and hydro-power costs. For example, atomic power is considered economically feasible in England and parts of Russia today.

Despite the fact that nuclear power in this country is more expensive than conventionally generated power, many electric utilities are now making plans to construct nuclear reactors. The motivation for constructing these very expensive facilities undoubtedly differs from utility to utility. Most of them, however, appear anxious to be the first in their regions to gain technological know-how and operating experience in nucleonics. Furthermore, many of them are working cooperatively with the Atomic Energy Commission and some of the leading industrial companies which are even more anxious to obtain invaluable working knowledge. Thus the burden of development costs is spread among all the interested parties.

In New England eleven of the leading private electrical utilities companies have banded together to form the Yankee Atomic Electric Company. This company has already developed a plan to construct a pressurized water nuclear reactor on the Deerfield River near Rowe in Western Massachusetts.

This summer the A. E. C. ruled that the initial proposal of this company which called for a substantial amount of Federal financial assistance was not acceptable. However, the Commission and the company are continuing to negotiate for a mutually satisfactory proposal. Moreover, the company is proceeding with a financing program to raise one million dollars to cover its preliminary development costs and has recently offered to go ahead with the project with a more limited amount of Federal aid.

New England of all regions in the United States has least to lose and most to gain from nuclear power. Fuel costs are higher here than in other regions and, as a result, the relative cost of gaining experience in running nuclear reactors is less. More important, nuclear engineers are expected to reduce the cost of nuclear power. This may be done by finding more efficient means of harnessing the heat released from atomic fission or by discovering a feasible means of harnessing atomic fusion. The resulting lower power costs might well benefit New England more than any other region.

II. *A Versatile Measuring Tool*

Several types of industrial measurement gauges using radio-isotopes have been used with great success for a number of years. These relatively simple devices measure the amount of radiation which is transmitted through (or reflected back through) almost any substance and thereby indirectly measures the thickness or volume of the substance.

These gauges are extremely versatile. They are now being used in industry to measure the thickness of continuously moving sheets of paper, rubber, plastic, and metal as well as the plating of various metals. They can also be used to measure the volume of a substance within a closed container and to gauge and record the depth of the snow at locations which are usually inaccessible.

Radiation measurement gauges have numerous ad-

vantages over conventional types of equipment:

1. They are extremely sensitive. Some thickness gauges, for example, can measure to the nearest 1/100,000 of an inch.

2. They make no contact with the object being measured and therefore can be used in a continuous industrial process.

3. They are simple devices and are relatively inexpensive.

4. They can be adapted to provide a continuous record of measurement.

5. They can be adapted to automatically adjust the thickness or flow of materials when the gauges indicate that specifications are not being met.

The measurement gauges have a wide range of uses in a number of New England's important industries. For example, many paper, rubber, metal fabricating, and metal plating companies have already seized upon these new measuring tools as means of improving quality and lowering costs.

Possibly even more important for this region, however, is the fact that a few New England firms have pioneered in the production of nuclear radiation instruments of this kind and are still the nation's leading producers. Moreover, the New England Governors' Atomic Energy Committee has stressed that the production of these instruments is important because it is likely to induce the growth of the allied instrument and control equipment business in the region.

III. *Radiation for Sterilization, Processing, and Radiography*

The development of large and dependable sources of controllable radiation has helped scientists and industry to invent a number of new processing techniques.

For example, most major drug manufacturers are interested in radiation as a destroyer of bacteria and are supporting or are actively engaged in radiation sterilization research. This method of sterilization is relatively expensive now, but it is being developed for processes where chemicals or heat cannot be used. One large drug company recently arranged to have one of its products sterilized by radiation after it was packaged. In this way, bacteria entering the drug both before and during packaging are destroyed. This same company is reported to be prepared to use radiation sterilization in the production of antibiotics and certain vitamin suspensions.

Food processors have become intrigued by radiation because it would permit continuous rather than "batch" processing, enable many of them to use a lighter weight can, and it would avoid steam sterilization which destroys the "fresh" flavor of some foods. Unfortunately the intense radiation which is necessary for complete sterilization has important "side affects" on most foods. Unless new techniques are devised, it is doubtful that a large amount of commercial food processing with radiation will be possible in the near future.

On the other hand, scientists are quite optimistic about using small amounts of radiation to partially sterilize or "pasteurize" certain foods and thus prolong their shelf life. One of these foods is fish. The entire New England fishing industry would benefit if a commercial radiation process were developed for its products. "Fresh" fish could then be stored longer and shipped farther.

In another area radiation has already proved itself. Research conducted for the Army has shown that insect infestation in cereal grains, cereal products, dried fruit products, and military ration components can be destroyed with relatively small doses of radiation. Furthermore, the taste of these products is not harmed in the process.

It has also been discovered that potatoes subjected to a limited amount of radiation can be prevented from sprouting for over a year with no appreciable change in the taste or texture of the potato. This discovery has not been commercially developed as yet, but eventually it may help New England potato growers to market their crop over a longer period of time.

It is possible that New England farmers may benefit in other ways from radiation techniques. The New England Committee on Atomic Energy has pointed out that Scandinavian countries have irradiated seeds and thereby have developed plant mutations which grow better in the rugged Scandinavian climate. The Committee suggests that similar experimental work should be conducted in New England.

In a more dramatic field, radiation sterilization has proved successful in delicate heart surgery developed at Massachusetts Institute of Technology and Harvard. Aortas removed from fresh cadavers and sterilized with ionizing radiation have been transplanted successfully to human beings.

The chemical effects of radiation have important possibilities in the rubber, petroleum, and plastics industries. For example, polyethylene plastics become tougher and more resistant to heat after being irradiated. The Pittsfield, Massachusetts, plant of General Electric has already developed a commercial process for producing such plastics for electrical insulation. Many experts hope that eventually irradiated plastics will compete with metal piping and certain of the structural materials.

The New England Governors' Atomic Energy Committee has pointed to the jewelry industry as still another possible user of atomic energy. Radiation can change the color and other characteristics of semi-precious and precious stones. While this might involve the jewelry industry in a number of ethical complications, it would develop a number of new products.

The jewelry industry is composed of a large number of small firms, none of which have the facilities for this kind of research. For this reason, the Committee has suggested that jewelry research should be carried on by private laboratories or by university experiment stations in the jewelry manufacturing states.

Radiation is proving increasingly useful in several other fields as a result of the development of high voltage X-ray machines. These machines are particularly useful in the therapy of deep-seated cancer. They have also been adapted for industrial radiography and are now used by industry to inspect the internal structure of castings, forgings, and weldments.

IV. *Tracers*

One of the less glamorous and yet most important applications of nucleonics is the use of radio-isotopes as

tracers. Radio-isotopes are unstable atoms which constantly emit particles and/or electromagnetic waves. These atoms can be identified wherever they are. Moreover, they retain the same chemical properties as ordinary atoms. For example, a radioactive isotope of carbon reacts no differently in a chemical reaction than an ordinary carbon atom.

These characteristics permit scientists to follow and positively identify a small batch of radioactive tracer atoms in a complex chemical process even though they are in the presence of huge quantities of other atoms. No physical or chemical phenomenon can destroy the radioactivity of a tracer atom.

The tracer technique is particularly useful in many types of research because of its sensitivity. In fact, for some short-lived isotopes, tracer sensitivity is a million million times greater than ordinary chemical and spectroscopic analyses.

Medical researchers — especially in New England — are making the greatest use of radio-isotopes. Tracers have already given scientists a much better understanding of the dynamics of human metabolism. They are also valuable in medical diagnosis. Doctors can determine the flow or volume of body liquids with radioactive atoms. They can also locate abnormal tissue which selectively absorbs certain radioactive dyes. Many brain tumors, for example, can be discovered in this way without surgery.

In agricultural research, tracers have been particularly effective in fertilizer intake and utilization studies. More important, the mysteries of photosynthesis are gradually being revealed with the aid of tracers.

Industrial firms have also seized upon tracers and are using them for such diverse purposes as measuring the circulation of catalysts in petroleum plants, locating leaks in water pipes imbedded in concrete floors, and measuring the amount of metal worn off piston rings.

New England is not only an important user of radio-isotopes for tracers, but also an important supplier of all kinds of radio-isotopic compounds. For example, Tracerlab, Inc. of Boston is one of the largest suppliers of radio-isotopes in the world.

The total volume of business in refining and distributing radio-isotopes is relatively small. However, the New England Committee on Atomic Energy suggests that more growth in this business would be highly desirable because it employs "highly trained scientific and technical personnel, thus further utilizing and developing the concentration of such resources in this area."

V. *Radiation and Nuclear Fuel*

The New England Committee on Atomic Energy has stated that by-product radiation from nuclear power reactors may be used economically in future years.

The Committee goes on to state, however, that no such processing system has yet been developed and concludes that "It would be much wiser today to hope for, rather than to count on, any reasonably near-term future value from by-product radiation in connection with any nuclear facility in New England."

It appears, therefore, that New England cannot receive any immediate benefit from by-product radiation from the proposed Yankee Atomic Electric Company reactor in Western Massachusetts.

The Committee goes on to point out, however, that New England has been a leader in producing and developing electron accelerators. It states that this is important because "accelerators are at present usually the only radiation sources suitable for processing consideration." The High Voltage Engineering Corporation of Cambridge, Massachusetts, is a principal producer of such equipment.

It appears that the increasing number of uses of processing radiation will help the growth of firms manufacturing electron accelerators.

At the present time, the only producer of nuclear fuel in this country is the Federal Government. In the near future, however, it is expected that private companies will assume much of the responsibility for processing uranium ore and fabricating fuel elements.

The Committee suggests that some uranium ore processing is possible in New England. Much of the world's supply of uranium comes from the Belgian Congo and it could be shipped here at less expense than to many other parts of the country. However, large quantities of low cost energy are needed to produce the enriched uranium fuel which is used in many nuclear reactors. For this reason, the Committee suggests that the region might specialize in the production of natural uranium fuel elements (used only in certain types of reactors) or might import enriched uranium from inland concentration points "to fortify" the natural uranium being processed here. The Committee also points out that uranium ore processing has been studied for some time at the A. E. C. research laboratory at Winchester, Mass., which is operated by the National Lead Company.

Several New England firms have the special skills needed to fabricate fuel elements from processed uranium ore. Metals and Controls Corp. of Attleboro, Massachusetts, already has submitted an application to the A. E. C. for a license to produce fuel elements. The Committee also points to Nuclear Metals, Inc. of Cambridge, Massachusetts, and Sylvania Electric Products, Inc. as being competent in this general field.

Conclusion

A number of the applications of atomic energy mentioned in this article are now used commercially. Tracers, measuring gauges, radiation sterilization of drugs, irradiated plastic for electrical insulation are among the established uses. Much more important for New England and the nation, however, are the uses now being developed in industrial and research laboratories here and throughout the country. With the aid of the millions of dollars which are now being spent annually on nuclear research and development by the Federal Government, electric utilities, drug companies, food processors, chemical, and electrical firms of all sorts, nuclear technology will become increasingly important.

New England lacks the abundant mineral and fuel resources possessed by many of the other regions of the country. However, this new technology makes use of one of the region's most important resources — the know-how possessed by its people working in all types of firms associated with nuclear technology. For this reason, nucleonics is a promising growth industry for New England.

Employment Expands Slowly

DURING the first eight months of 1955 New England industry made substantial strides toward recovery of the job losses suffered during the 1954 recession, but additional expansion will be required before the 1953 peaks are overtaken. By mid-August, nonfarm employment in New England had recovered over half of the 187,000 jobs lost between the June 1953 peak and the March 1954 low. Nearly one-fourth of the job loss experienced between the February 1953 peak and the July 1954 trough in manufacturing employment has been regained. This recovery is somewhat sluggish in comparison with that in the rest of the country. The nation has recovered about 83 per cent of its recession drop in total nonfarm employment and 61 per cent of its manufacturing loss.

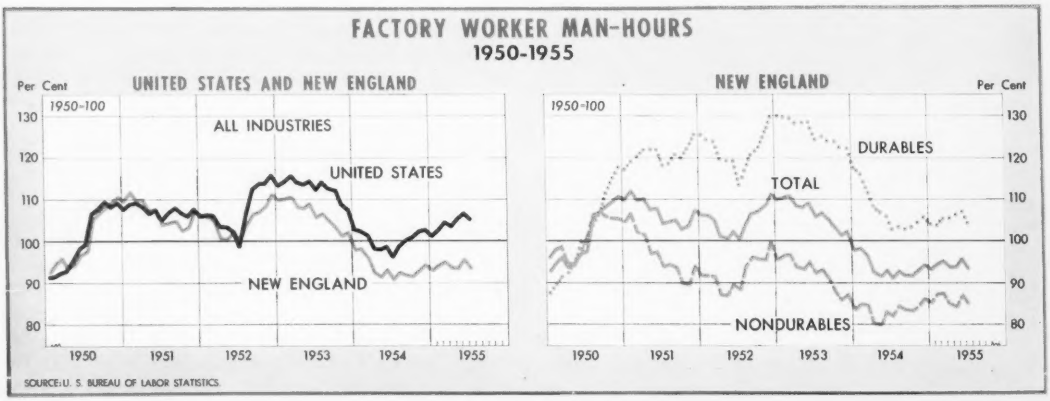
The 1955 increases in employment in New England were accompanied by a lengthening of the workweek in many of the region's manufacturing industries. Longer hours and higher wage rates resulted in record average weekly earnings for many of the region's factory workers. While flood-created unemployment swelled jobless roles in affected areas of Connecticut, Massachusetts and Rhode Island in late August, by mid-September rehabilitation was well under way.

This year the usual seasonal decline in New England employment between June and July was less than in any other postwar year except 1950. The manufacturing industries were principally responsible for the July dip with job totals down in both durables and nondurables. Nonmanufacturing employment continued to expand but not sufficiently to offset the factory losses.

Widespread vacation shutdowns were the principal causes for the decline in manufacturing employment in July. The only industries which increased workforces over the June level were lumber and wood products; stone, clay and glass; and food. In comparison with July 1954, however, all of the manufacturing industries in New England showed employment gains except the ordnance, primary metals, transportation equipment and textiles industries. The largest numerical job loss over the year was in the textile industry, in which a large segment of the cotton and rayon workers were on strike from mid-April to early July. The durable goods industries, led by fabricated metal products and nonelectrical machinery, were mainly responsible for the gains in manufacturing over the year.

Nonmanufacturing activities accounted for close to two-thirds of the nonfarm employment gain in the past year. Contract construction registered the largest year-to-year increase, but all of the industries in the nonmanufacturing group except transportation and public utilities expanded their workforces.

In most sections of New England the workweek of factory production workers, while dipping slightly in July, has been longer in 1955 than in comparable months of last year. As a result of the longer hours and higher level of employment, the index of manhours worked by production workers in New England manufacturing industries has exceeded year-ago levels since April.

Recovery for the nation has been sharper than in the region since mid-1954, as shown in the accompanying chart, which compares the manhours index for New England with that for the United States. The continued lag in New England's nondurable goods industries is largely accounted for by the continued slack in the region's textile industry. The performance of the region's durable goods industries since 1950 was relatively better than for the nation until late 1954 when the recovery of these industries was more pronounced nationally. Apparently other areas are receiving greater impetus from the pickup in steel and automobile production.

The general improvement in business conditions has resulted in a decline in insured unemployment in New England of almost a third from a year ago. Throughout 1955, both initial claims and insured unemployment have been running under the comparable months of 1954. In June, the number of jobless was at the lowest level since November 1953. Late in August initial claims for unemployment compensation were filed by close to 40,000 workers in plants damaged by floods which hit heavily industrialized areas of the region and lifted total claims for the month above year-ago levels. Most of the job loss, however, was only temporary.